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Feb. 9, 1926. 1,572,695

O. H. VAN AMBURG ET AL

ELECTRIC SWITCH

Filed Dec. 8, 1921

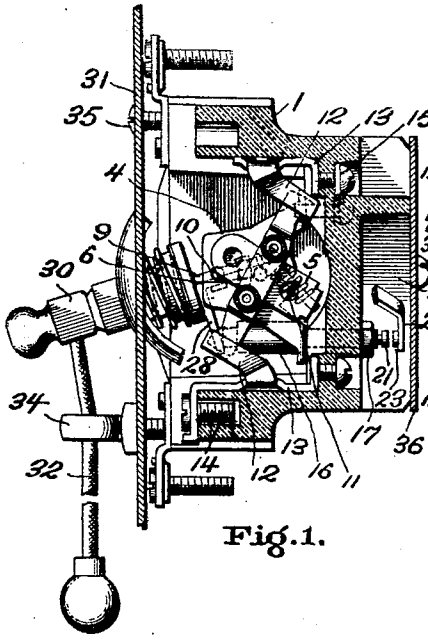


Fig.1.

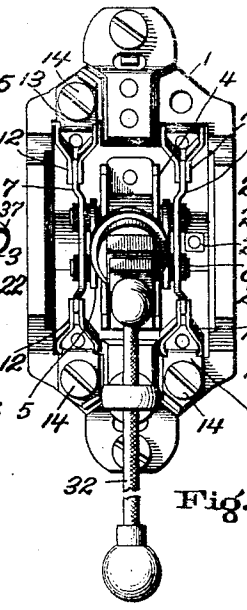


Fig.2.

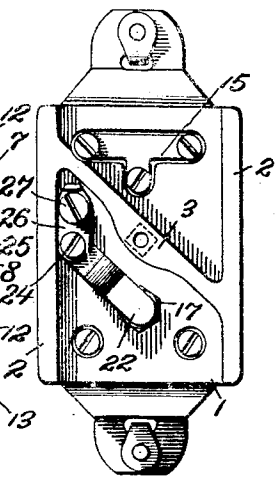


Fig.3.

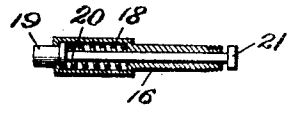


Fig.4.

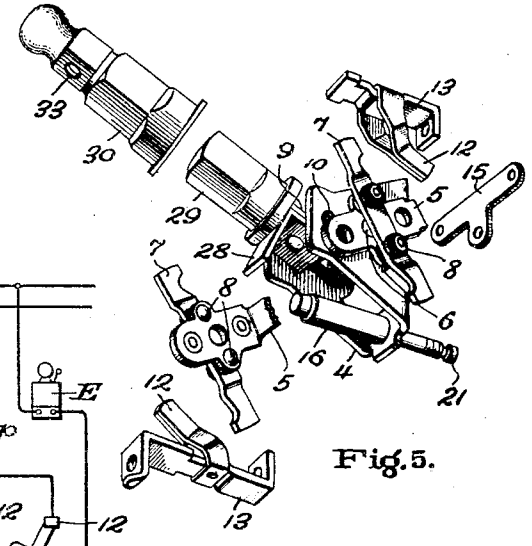


Fig.5.

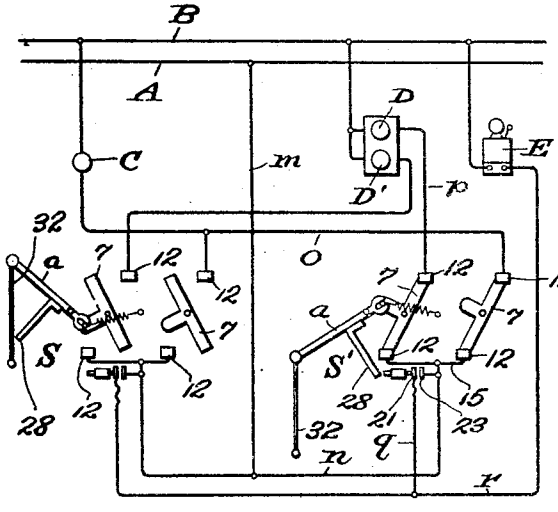


Fig.6.

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UNITED STATES PATENT OFFICE.

OTTO H. VAN AMBURG AND LESLIE A. KEMPTON, OF BRIDGEPORT, CONNECTICUT, ASSIGNORS TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC SWITCH.

Application filed December 8, 1921. Serial No. 520,960.

To all whom it may concern:

Be it known that we, OTTO H. VAN AMBURG and LESLIE A. KEMPTON, citizens of the United States, residing at Bridgeport, in the county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

The present invention relates to signal systems such as are installed in hospitals and similar institutions whereby a signal given at any one of a plurality of stations located in a sick room may be definitely indicated to an attendant in another part of the establishment.

It is a common practice to provide an electric call station at each bedside, a pilot lamp in proximity to the bed to enable the patient to know the circuit has been completed and the attendant to know which patient in the room made the call, a second lamp in the corridor adjacent the door of the particular room to serve as a director to the attendant, and audible or visible signals, such as bells or buzzers or annunciators, in the nurses' quarters or the chart-room.

The object of our invention is to provide an improved call station switch adapted to control the lamp circuits and the bell or buzzer circuits and in which all live parts are effectively housed. A further object is to provide a switch mechanism of this character which will enable the patient to make successive closures of the bell or buzzer circuit while the lighting circuits remain closed until opened by the nurse at the calling station.

One embodiment of our invention is shown in the accompanying drawing in which:

Fig. 1 is a vertical sectional view of the switch mechanism; Fig. 2 is a front elevation of the switch with the face plate removed; Fig. 3 is a rear elevation of the switch base; Fig. 4 is a longitudinal section of the auxiliary plunger contact; Fig. 5 is a perspective view of the main parts of the switch mechanism; and Fig. 6 is a wiring diagram of the signal system.

The base 1 of the switch is of molded porcelain and of the box shape in general use except that it is provided on its back side with extension walls 2 and 3 forming between them insulated pockets for live parts to be referred to later.

The main switch movement is of the well known tumbler or over-center type and comprises a bent up frame 4 secured to the inside of the rear wall of the base, a U-shaped rocker 5 extending freely beneath the frame 4 and pivoted at 6 to the sides thereof, pole pieces 7 connected to opposite ends of the rocker 5 by pins 8, and operating lever 9 disposed between the bent up ends of the frame and pivoted near the outer ends thereof at 10 and a compression spring 11 arranged to thrust against the end of the lever 9 and the rocker 5 so that as the actuating lever is thrown past the line of centers the spring reacts to move the rocker and pole pieces into the opposite position and yieldingly retaining said parts in such position until the actuating lever is again manipulated. Arranged to cooperate with the pole pieces 7 are four stationary contacts 12 carried by brackets 13 secured by screws in the respective corners of the base 1. Three of the brackets 13 have their front ends bent outwardly and provided with binding screws 14, while the fourth bracket is cut off just in front of the contact clip as shown in Fig. 1. This fourth bracket and the frame 4 are electrically connected with the upper complete bracket 13 by a T-shaped strip 15 at the back of the base and joined to those parts by screws extending through the base.

The frame 4 has attached thereto near the lower end a guide post 16 which extends through the back of the base and provided with a nut 17 which serves as an anchoring means for that end of the frame. The upper end of the post 16 is enlarged to receive a spring 18 and a plunger head 19 which carries a contact rod 20 extending through and beyond the end of the post where it is provided with a tungsten tip 21. A spring contact finger 22 having a coacting tip 23 opposite tip 21 is secured to the back of the base by a screw 24 engaging a nut 25 inside thereof. A short metal strip 26 provided with a binding screw 27 is secured in place and in contact with the finger 22 by the screw 24.

In order to depress the plunger rod 21 into engagement with the spring finger 22, the actuating lever 9 is provided with a finger 28 adapted to normally engage the plunger when the lever is in the "on" or depressed position. However, the tension

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of the spring 18 is sufficient to prevent movement of the plunger under such normal engagement, but when sufficient external force is applied to the lever 9 the spring 18 yields and the contact tips 21 and 23 are brought together.

The actuating lever 9 has a squared block 29 of insulating material molded thereon and over this block is telescoped a sheet metal extension 30 which projects out through a slot in the face plate 31 and serves as a handle.

In order that the switch may be conveniently actuated to closed position by the patient, a pull cord 32 is connected to the handle by being passed through a hole 33 in the side wall of the sheet metal extension and knotted inside thereof, and to insure that the pull on the cord shall be exerted at all times in the right direction upon the actuating lever there is provided a guide eye 34 having a screw-threaded shank adapted to be inserted in place of one of the usual retaining screws 35 of the face plate.

The pockets at the back of the base are enclosed by an insulating sheet 36 held in place by a set screw 37.

A wiring diagram of one form of signal system employing our switch is shown in Fig. 6 in which A and B represent the wires of the usual house lighting circuit, S and S′ two switches installed adjacent respective beds in a single sick room, C an incandescent signal lamp installed just outside the door to the sick room, D and D′ are lamps installed in the sick room, and E is a bell or buzzer installed in the chart or nurses' duty room.

When a patient desires to call a nurse he pulls upon the cord 32 causing the movable parts of the main switch to snap into the position indicated at S′ so that current passes from wire A, branch *m*, *n*, plate 15 to the contacts 12, poles 7, and the second contacts 12 respectvely connected by wires *o* and *p* with the door lamp C and the pilot lamp D then on to the return wire B. By exerting a further pull on the cord 32, the actuating lever 9 will be depressed so that its finger 28 forces the contacts 21 and 23 together and completes an auxiliary crcuit from plate 15, wires *q* and *r* to the bell or buzzer E and on to the return wire B. As soon as tension on the cord is released the auxiliary contacts separate automatically and open the circuit through the bell or buzzer while the circuits through the door and pilot lamps remain closed. Successive calls may be made by merely pulling and releasing the cord. The door and pilot lamps will remain on until the nurse manually throws the switch lever to the up or off position.

It will be understood that where several call stations are installed in a single sick room, the connections will be in multiple with those shown in Fig. 6 with the addition of corresponding pilot lamps.

While we have shown and described the best embodiment of the invention known to us, we do not desire to be restricted thereto.

What we claim as new and desire to secure by Letters Patent of the United States, is:—

1. In an electric switch, the combination of stationary contacts, a pole piece movable into and out of engagement therewith, a spring for moving said pole piece with a snap action, an oscillating actuating lever connected to said spring and normally held thereby in opposite positions, a spring-pressed plunger adapted to be actuated by said lever, and auxiliary contacts controlled by said plunger.

2. In an electric switch, the combination of a pair of stationary contacts, a switch frame, means for permanently connecting said frame and said contacts electrically, a second pair of contacts, two pole pieces each adapted to connect a contact of one pair with a contact of the other pair, an auxiliary spring-pressed contact electrically connected to said frame, an actuating lever connected by a spring to said pole pieces and adapted in its normal operation to throw said pole pieces to their opposite positions without operating the auxiliary contact and adapted in its abnormal operation to operate said auxiliary contact without operating said pole pieces.

3. In an electric switch, the combination with the switch mechanism of an oscillating actuating lever, a spring disposed between said lever and switch mechanism which tends to retain said lever in extreme opposite position, a spring-pressed plunger arranged to arrest said lever before reaching one of its extreme positions, and auxiliary contacts controlled by said plunger.

4. An electric switch device comprising a main switch and an auxiliary switch, a toggle mechanism for the main switch including an oscillating switch lever, and a spring plunger by which said lever is halted at one end of its throw, said plunger being displaced by further movement of the lever to operate the auxiliary switch.

In witness whereof, we have hereunto set our hands this 6th day of December, 1921.

OTTO H. VAN AMBURG.
LESLIE A. KEMPTON.